



Neurological and behavior effects of Non Ionizing Radiation emitted from mobile devices on children: Steps to be taken ASAP for the protection of children and future generation

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*President of the Cyprus National Committee on Environment and
Children's Health*

*IUCP: CNS Pathology-Oncology an update for the general
pathologies*

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The Outline

1. PART A

- The threat of 21th century: Non ionizing radiation of Radio waves .
- Special vulnerability of the children -Potential neurological/behavioural effects

2. PART B :

Precautionary measures- reduction of exposure



Radiofrequency range (30KHz-300 GHz of Non Ionizing Radiation (EMF-RFR)

- It has lower Energy than ionizing radiation , can not brake chemical bonds but can cause thermal,electrical and biological effects
- Can penetrate the tissues more that infrared, visible and to some extent UV

30KHz-300GHz

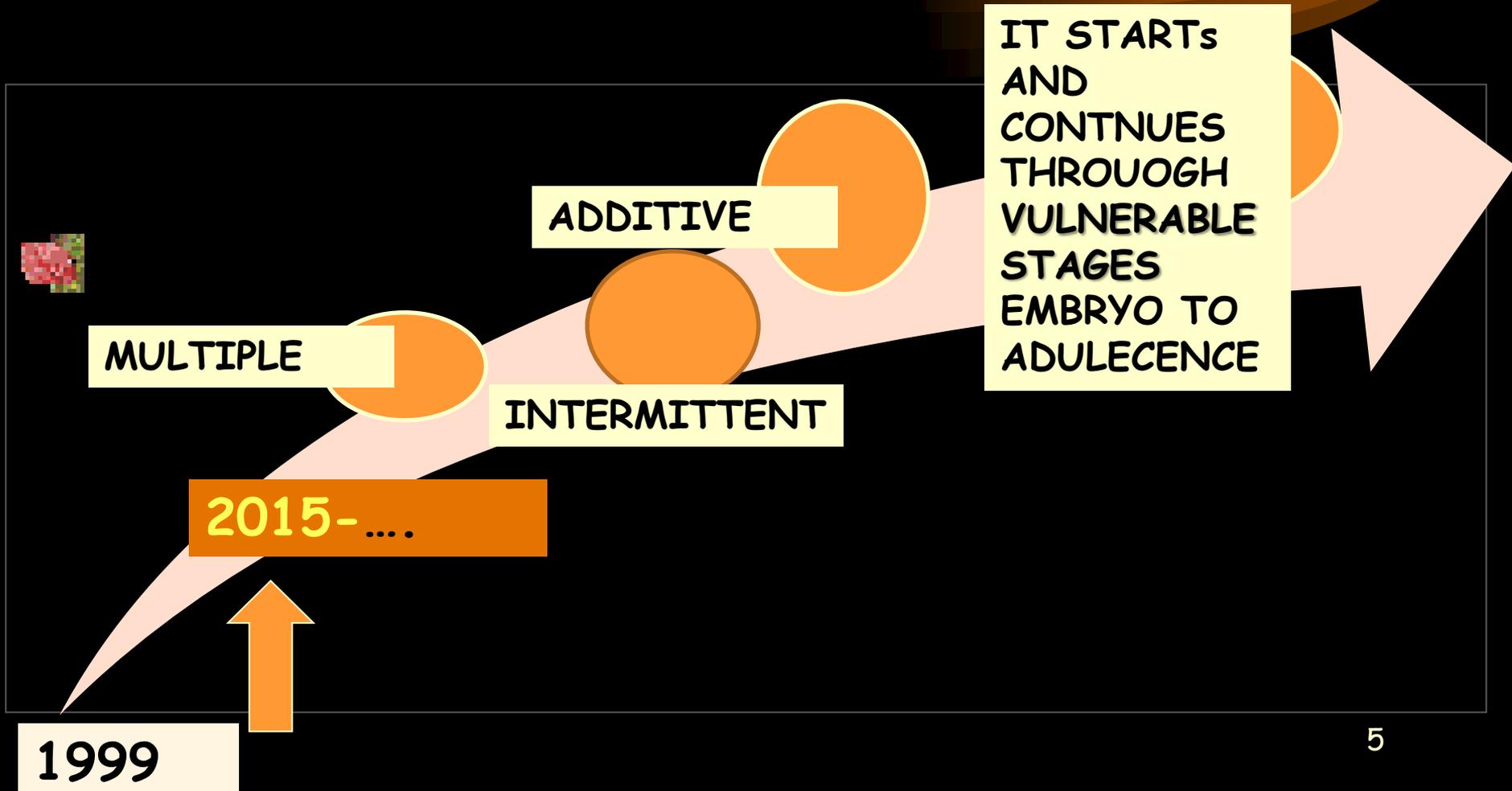


Radiofrequency range (30KHz-300 GHz of Non Ionizing Radiation (EMF-RFR)

- It carries information and because of this is PULSED and potentially more bioactive.
- Lower intensities are not always less harmful; It depends on potential synchronization with natural oscillators
- Intensity windows exist, where bio effects are much more powerful

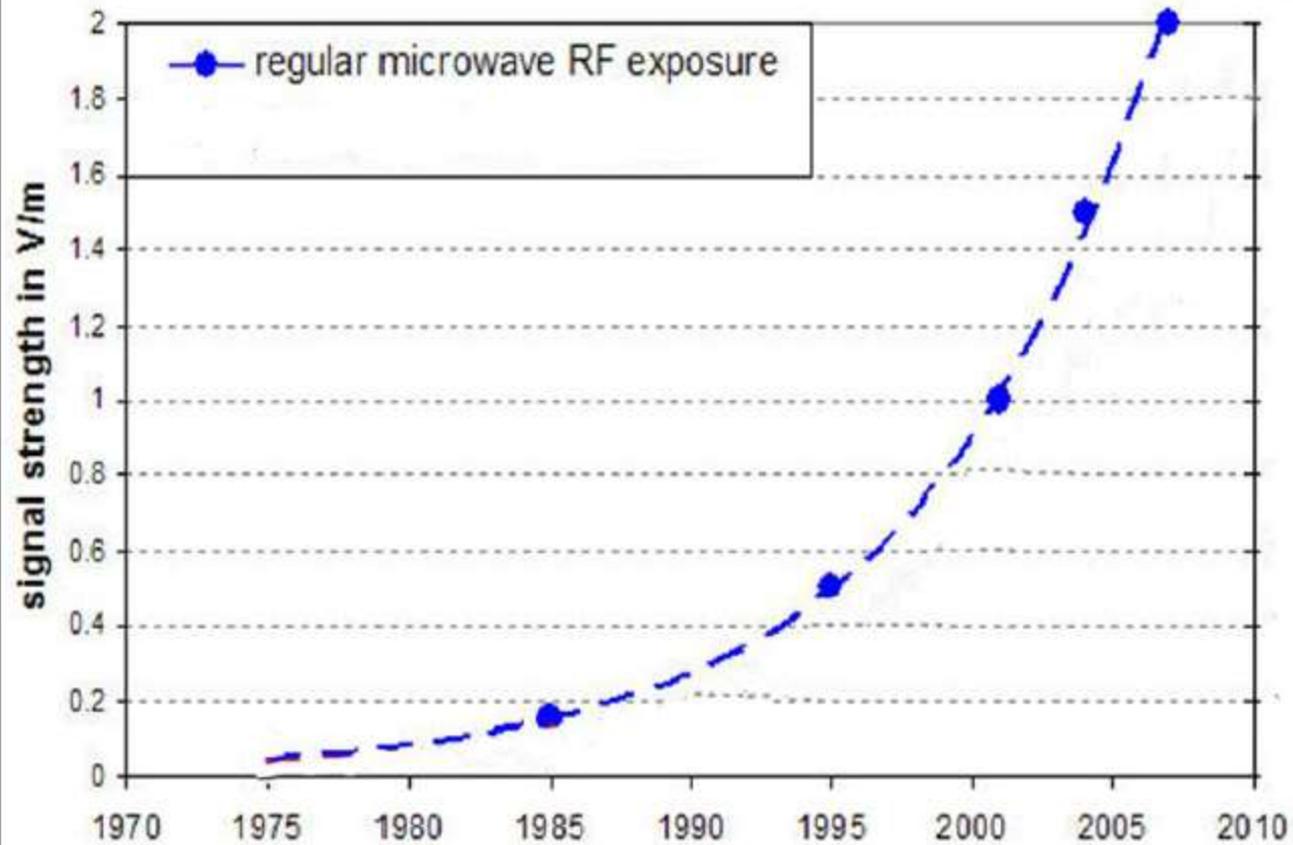


EMF-RFR can be extremely bioactive when exposure is repeated, intermittent and multiple





Typical Child Radiofrequency Exposure



Alasdair Philips, Powerwatch <http://www.powerwatch.org.uk/>



Children are exposed to an electromagnetic cloud created by mobile phones and other wireless devices and connections



Mob and DECT phones



Baby monitors

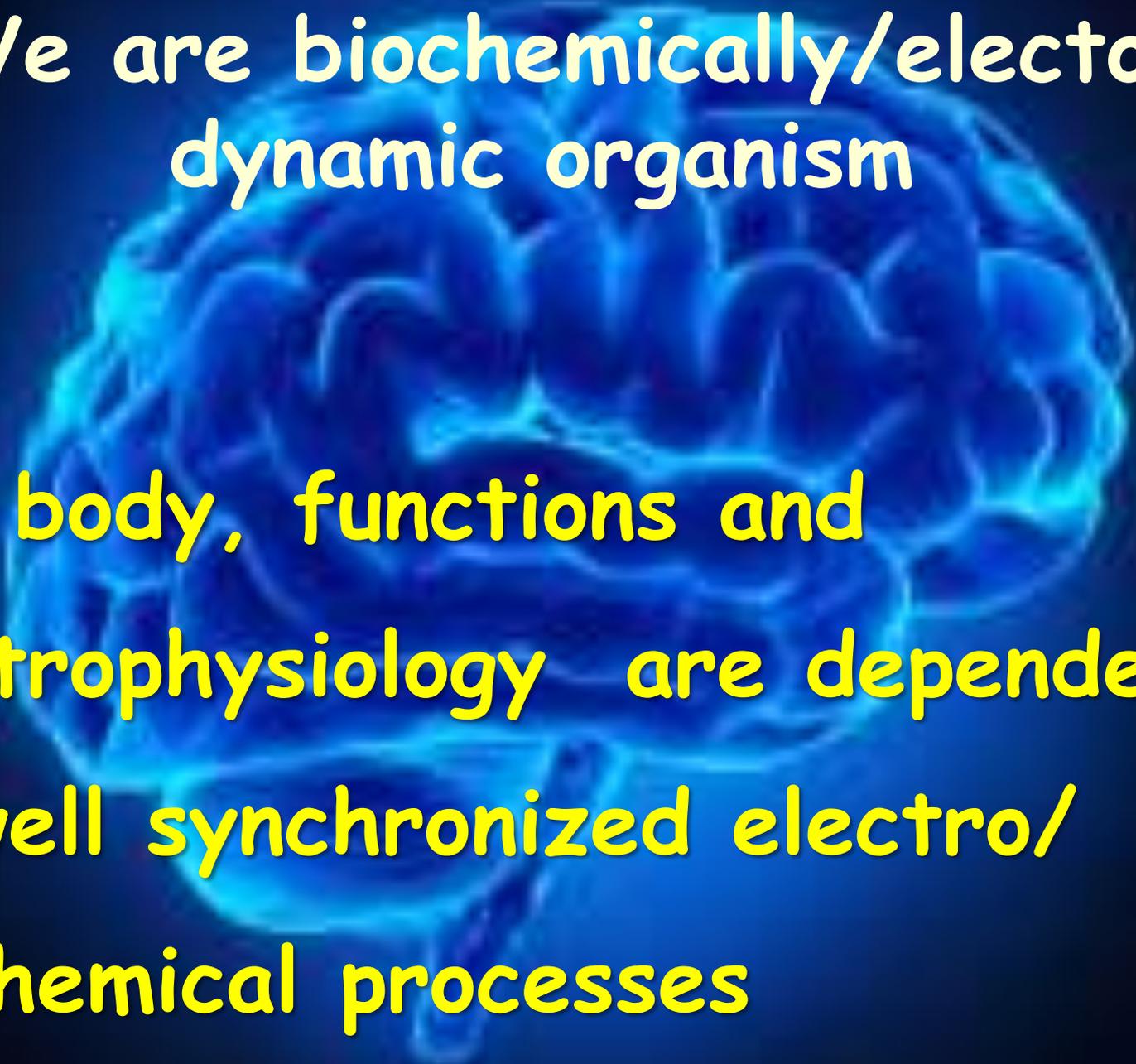


Bluetooth

- I pads, tablets - playing consoles Wireless connected laptops
- i-pads, tablets



ELECTRONIC CLOUD.....that

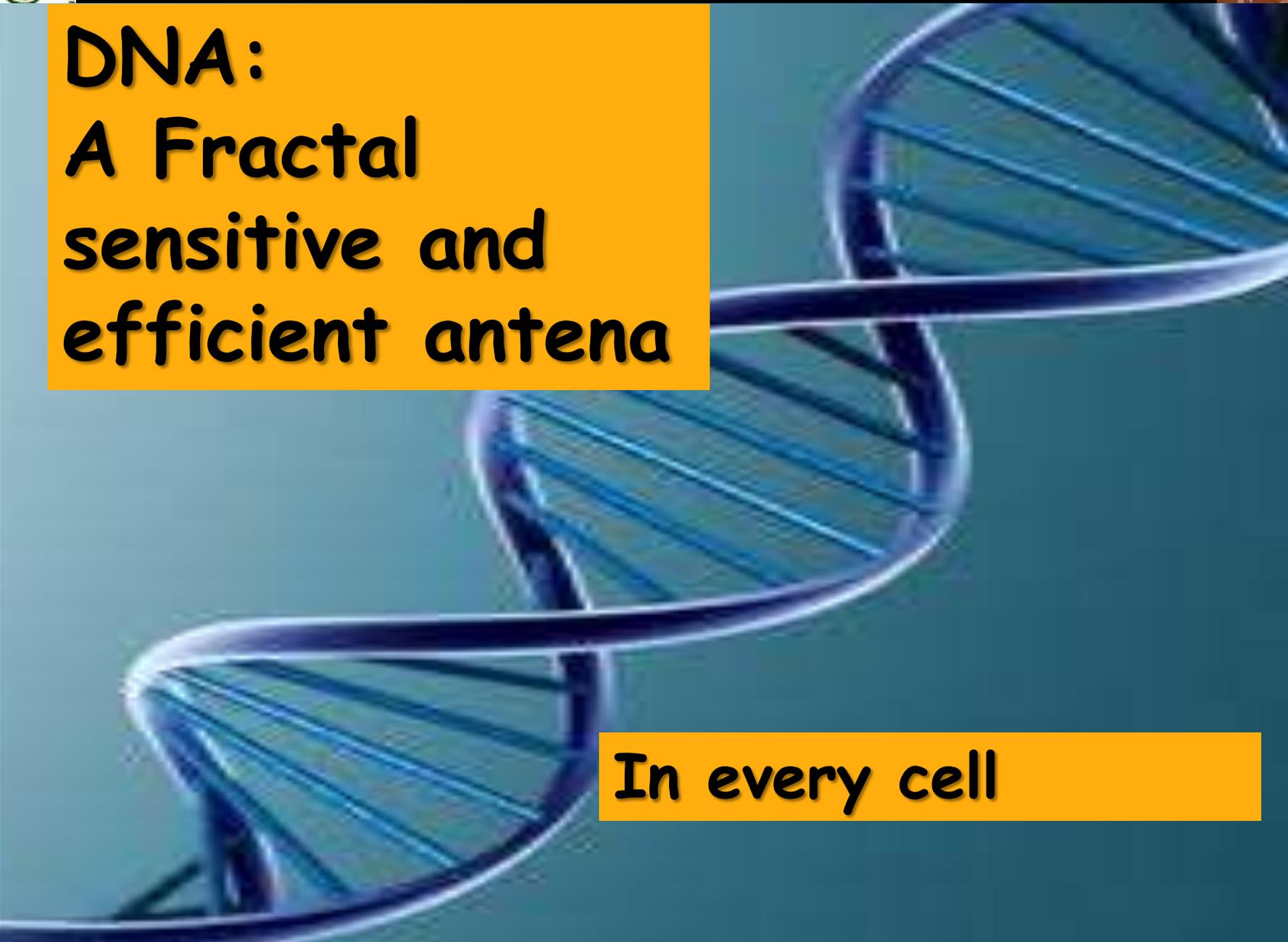


We are biochemically/electrodynamic organism

• Our body, functions and electrophysiology are dependent on well synchronized electro/biochemical processes

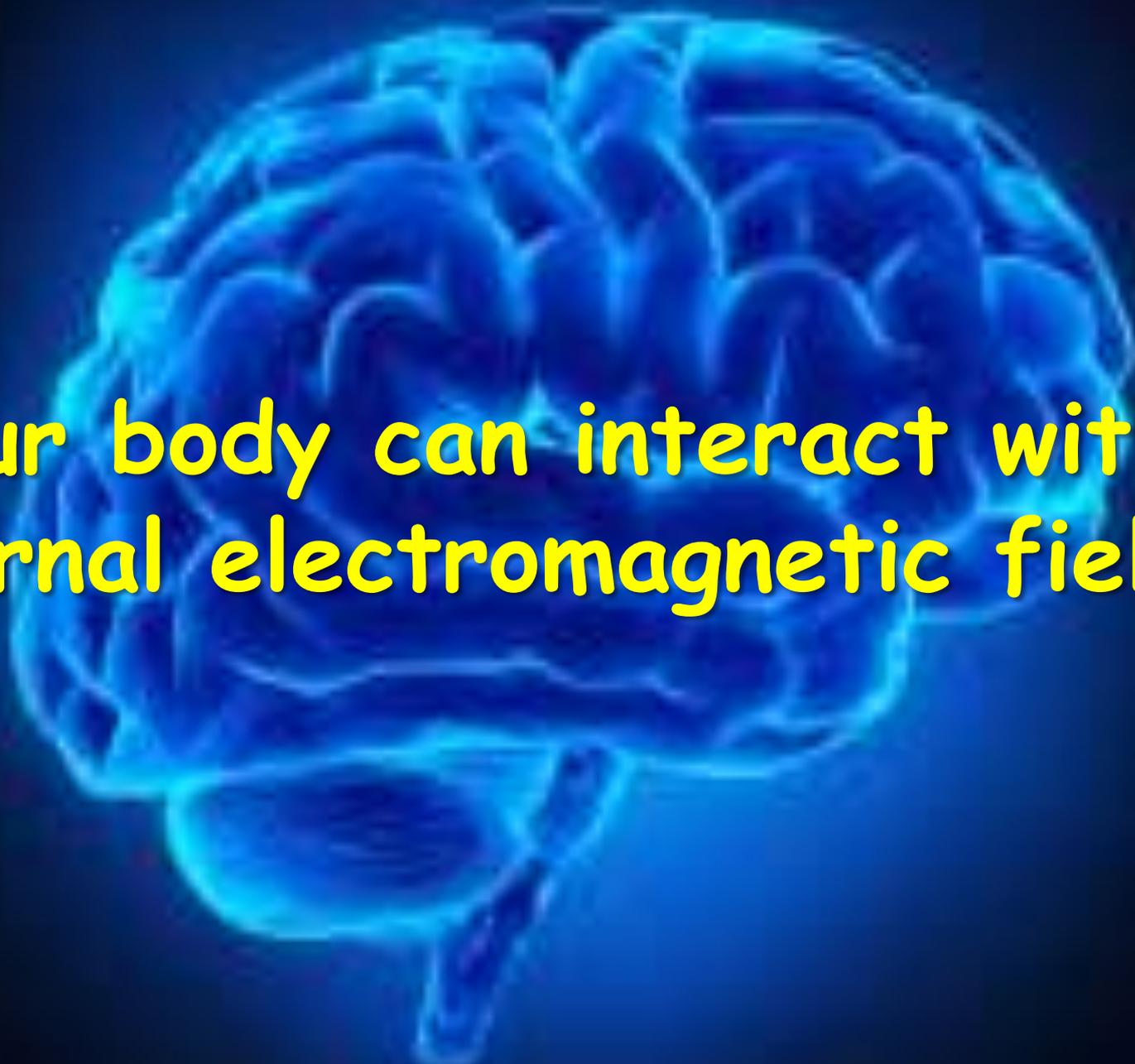
**DNA:
A Fractal
sensitive and
efficient antenna**

In every cell





Our body can interact with external electromagnetic fields





Because we are biochemically/electro dynamic

We are subjected to time-varying conditions

- **extrinsic** from the environment and
- **intrinsic rhythms**. These are generated by intrinsic cellular clocks e.g. the cardiac pacemaker and the circadian clock
- This 'clocks' are composed of **thousands of clock cells functioning in oscillatory synchronization**.



HOW these rhythms are affected?

- These oscillations can be disrupted by artificial signals e.g. EMF-RF resulting in desynchronization of the neural activity
- This in turn can dis-regulate critical functions (including metabolism) in the brain, gut and heart and circadian rhythms governing sleep and hormone cycles.



DIFFERENT EFFECTS

- **THERMAL effects** caused at relative high intensities at the level of W/m^2 (Established since 1999)
- **Non Thermal BIOLOGICAL effects** caused at extremely low intensities at the level of $\mu W/m^2$ especially under conditions of continuous /long term exposuresThe evidence is growing



EMF-RFR 30kHz to 300 MHz is possible Human Carcinogen class 2B IARC/WHO (May, 2011)*.



World Health Organization

- Covering all EMF-RFR-emitting devices and exposure sources (cell and cordless phones, WI-FI, wireless laptops, wireless hotspots, electronic baby monitors, wireless classroom access points, wireless antenna facilities, etc).

Recent Studies Reviews (2014-2015 Hardell) indicated the need for upgrading of Human carcinogenicity classification up to 2A or 1.

Mobile phone and cordless phone use and the risk for glioma – Analysis of pooled case-control studies in Sweden, 1997–2003 and 2007–2009

Lennart Hardell*, Michael Carlberg

Department of Oncology, University Hospital, Örebro SE-701 85, Sweden

Received 16 April 2014; received in revised form 25 September 2014; accepted 16 October 2014

THE STUDY DESIGN

- A pooled analysis of two case-control studies on malignant brain tumours with patients diagnosed during 1997–2003 and 2007–2009. They were aged 20–80 years and 18–75 years, respectively, at the time of diagnosis. Only cases with histopathological verification of the tumour were included.
- Population-based controls, matched on age and gender, were used.
- Exposures were assessed by questionnaires
- In total, 1498 (89%) cases and 3530 (87%) controls



RESULTS

- Mobile phone and cordless phones use increased the risk of glioma,
- The OR increased statistically significant both per 100 h of cumulative use, and per year of latency for mobile and cordless phone use. Highest ORs overall were found for ipsilateral (ομοπλευρο) mobile or cordless phone use,
- The highest risk was found for glioma in the temporal lobe.
- First use of mobile or cordless phone before the age of 20 gave higher OR for glioma than in later age groups.©



Mobile phone and cordless phone use and the risk for glioma – Analysis of pooled case-control studies in Sweden, 1997–2003 and 2007–2009

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- HILL CRITERIA FOR CAUSALITY FULLFILLED FOR new CLASSIFICATION AS
 - A HUMAN CARCINOGEN
- *“There is a consistent pattern of increased risk for glioma (a malignant brain tumor) and acoustic neuroma with use of mobile and cordless phones”* Lennart Hardell



But is not only cancer related
**RISKS. Other potential short
and long term effects may exist**

(supported by thousands of recent peer review studies, ref
Bioinitiative Report, 2012/2014)

Relative Short-term exposure may cause

- Insomnia, sleeping disorders,
- Attention deficit, learning difficulties,
- “Unexplained” changes in school performance,
- headaches, nervousness, ear tinnitus etc
- Pains at multiple body sites
- Baby is crying all night ...without reason?⁸

SC Michalidou



Biological effects are established a snapshot of the evidence (1/3) Ref

Bionitiative updated report 2014

- Abnormal gene transcription
- genotoxicity and single- and double-strand DNA damage
- Chromatin condensation and loss of DNA repair capacity in human stem cells

DNA IS
AFFECTED



Biological effects are established a snapshot of the evidence (2/3) Ref

Bionitiative updated report 2014

- Reduction in melatonin & other free-radical scavengers
 - ✓ Disruption of circadian rhythms
- Destruction of Myelin
- Increase the perfusion of blood-brain barrier
- Synthesis of Stress proteins

DEFENCE
MECHANISMS
ARE AFFECTED



: Biological effects are established

— a snapshot of the evidence (3/3)Ref Bionitiative
updated report 2014

- Impacts on human and animal sperm morphology and function
- Effects on neuronal, brain and cranial bone development in the offspring of animals
- Neurotoxicity in humans and animals -latent neurotoxicity
- Carcinogenicity in humans
- HYPERSENSITIVITY TO ELECTROMAGNETIC RADIATION : EHS



Proposed Mechanisms (ref Erika Malley,)

The radiation reduces melatonin levels and increases nitric oxide (NO) levels [[Yariktas 2005](#)]. These changes may

- May reduce the amount of cancer fighting cells in our bodies and the immune system's ability to repair cancer damage is compromised,
- May also promote sleeping disorders, increase blood pressure and cholesterol levels leading to greater risk of atherosclerosis and coronary heart disease, [[Aly 2008](#)]
- May also change the body's ability to cope with other toxins.



Proposed Mechanisms (ref Erika Malley,)

Changes in the choline uptake

- *A study by in the late 80's [[Lai 1989](#)] found that 45 minutes of exposure to pulsed microwaves affected choline uptake in the rat. .*
- **Choline is a chemical precursor or "building block" needed to produce the neurotransmitter acetylcholine,**
- **research suggests that memory, intelligence and mood are mediated at least in part by acetylcholine metabolism in the brain.**



FROM BIOLOGICAL EFFECTS TO HEALTH IMPACTS WHY??



Biological effects can lead to adverse health effects if exposure is chronic (1/2) Ref

Bionitiative updated report 2014

WHY ??

1, They interfere with normal body processes
(DISRUPT HOMEOSTASIS)

- ✓ prevent the body from healing damaged DNA,
- ✓ produce immune system imbalances,
- ✓ metabolic disruption and lower resistance to disease across multiple pathways.



Biological effects can lead to adverse health effects if exposure is chronic (2/2) Ref

Bionitiative updated report 2014

WHY ??

2. Essential body processes can eventually be disabled and lead to pervasive impairment of

- metabolic,
- neurological and
- reproductive functions



From Biological effects to diseases and disorders Ref

Bionitiative updated report 2014

- **Cancer,**
- **reproductive disorders,**
- **immune dysfunction,**
- **neurological damage and cognitive disorders has been documented repeatedly**
- **Behaviour problems in animals and child after in utero exposure -links to autism**
- **Hypersensitivity disorders like allergies ,asthma-EHS**



Review 2014, of peer review studies on biological effects of RFR

- Neurological Effects : positive 68% from 211 studies
- Effects on DNA: positive 65% from 114 studies

Most studies at cellular level in vitro (including human cells) . There are few epidemiological studies in humans , most studies in animals and plants

Ref : Bio Initiative 2012 Report 2014 Radiofrequency Radiation Research Summary
Updated March 29, 2014, & supplement summary for public



The % of Positive studies are dependent on the funding source (university of Bern 2006)

POSITIVE

- in 33% of industry supported studies
- In 80% of industry independent studies





RFR-EMF : A scientific controversy - Static Limits not relevant



Limits -1999/2009
Short exposure/shortterm effects

**NON THERMAL
BIOLOGICAL
Longterm effects**

Occur at substantially lower level of energy especially under conditions of continuous exposure

Biointiative report evaluation of 8000 peer reviewed studies 2007, 1800 new studies 2012-2014



Athermal biological effects compared to thermal ones can be happened at at much lower radiation levels. These levels are by 100000-1 million times lower than the ICNIRP especially under continuous and repeated exposure conditions



LIMITS INTERNATIONAL -

ICNIRP

Η Κύπρος και οι πλείστες



10,000,000 $\mu\text{W}/\text{m}^2$

Limits based on biological effects till 2007

Salzburg Resolution 2000	1000 $\mu\text{W}/\text{m}^2$
BioInitiative Report 2007	1000 $\mu\text{W}/\text{m}^2$
Austrian Antenna System Guideline	1000 $\mu\text{W}/\text{m}^2$

Limits based on biological effects till 2015

Austrian Sustainable Building Council	10 $\mu\text{W}/\text{m}^2$
BioInitiative Report 2012	3-6 $\mu\text{W}/\text{m}^2$
Austrian Medical Association 2012	1 $\mu\text{W}/\text{m}^2$
Building Biology Guidelines 2015	0.1 $\mu\text{W}/\text{m}^2$
Natural background	0.000 001 $\mu\text{W}/\text{m}^2$

HΜΕΡΙΑΔΑ Cyprus 22-10-15, Λ.Χ. ΜΑΡΓΑΡΙΤΗΣ



EUROPEAN PARLIAMENT, COUNCIL OF EUROPE, MEDICAL AND SCIENTIFIC ASSOCIATIONS ARE CALLING FOR BIOLOGICAL RELEVANT LIMITS

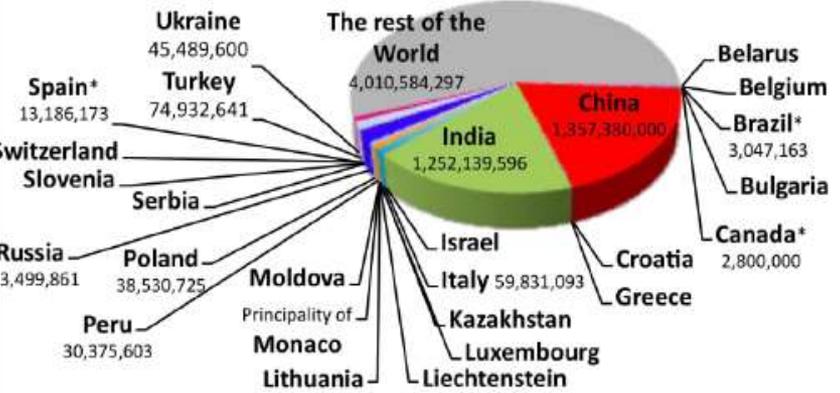
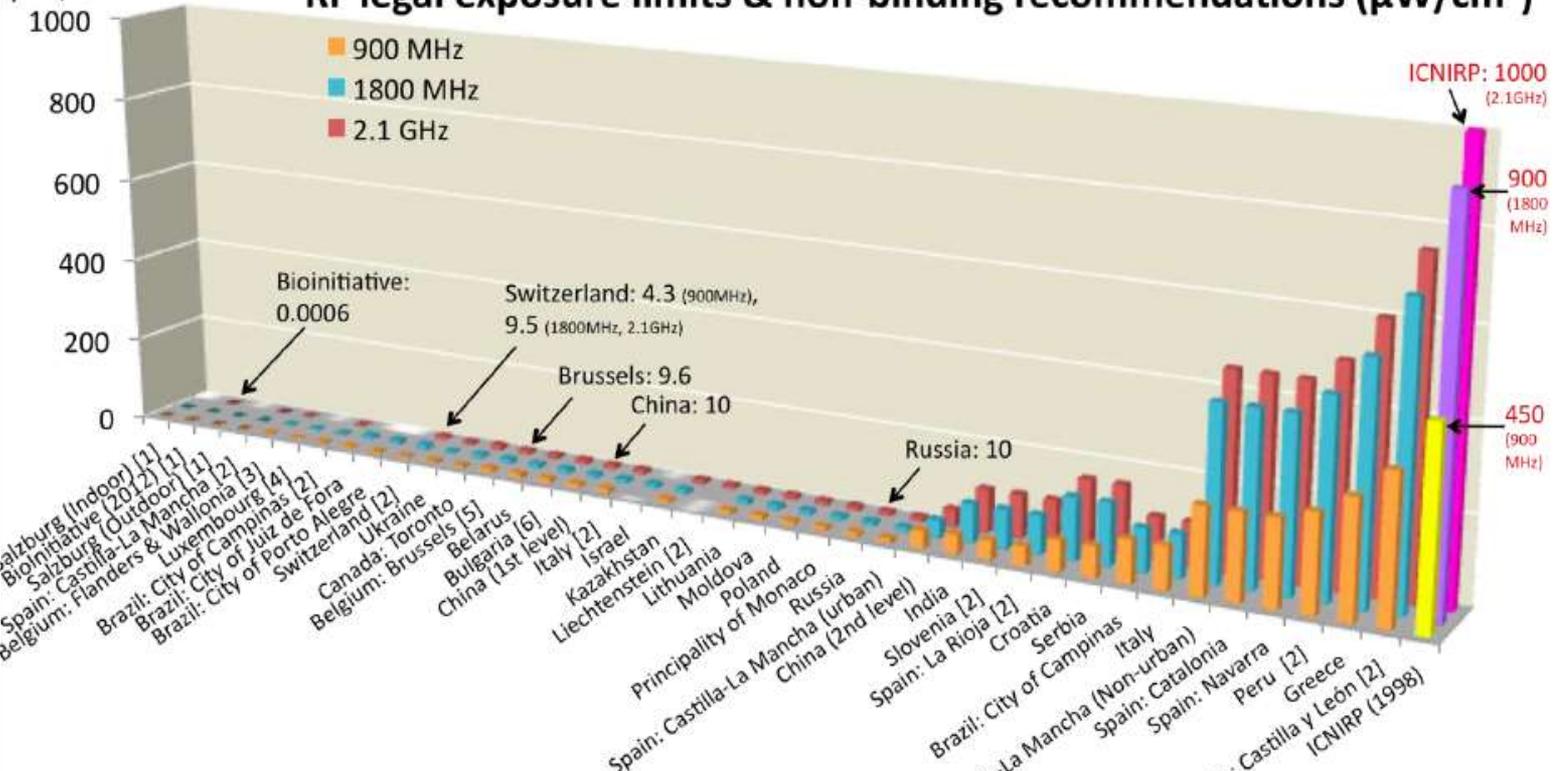
EUROPEAN PRLIAMENT 2012



:"the limits on exposure to electromagnetic fields which have been set for the general public are obsolete" and called upon the Council to "set stricter exposure limits for all equipment which emits electromagnetic waves ..."



RF legal exposure limits & non-binding recommendations ($\mu\text{W}/\text{cm}^2$)



[1] Precautionary recommendation. [2] Sensitive areas.
 [3] Maximum threshold per antennae. [4] Maximum per operator & per antennae system.
 [5] For all antennae taken together. [6] Periodical & short stay areas.

• Total World population: 7,124,543,962**
• Population with more rigorous EMF standards/guidelines: 3,113,959,665**
 (approx. 44% of World population)

** Main population data source: The World Bank (2014).

© Dr Isaac Jamieson 2014



The impact of EMF-RFR is dependent on :

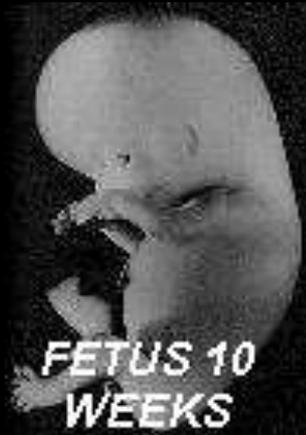


- Modulation and strength of the radiation
- THE DISTANCE FROM THE EMMITING SOURCE
- EXPOSURE DURATION and HOW OFTEN THIS HAPPENS
- THE PENETRATION AND ABSRPION RATE
- SENSITIVITY / VULNERABILITY of the exposed





WHY CHILDREN ARE MORE VURNERABLE



Child with neurological disorders, recovered from cancer therapies III,





INCREASED RISKS AND POTENTIAL EFFECTS FOR FETUS AND CHILDREN (WHO)

- Immature organs, systems and functions constantly developing, and DEFENCE MECHANISMS
- Faster cell division and higher vulnerability to genotoxic effect
- More years of exposure and higher risk to develop long-term diseases such as cancer
- Strong evidence: Absorption of electromagnetic radiation from the child's brain might be greater and in deeper tissues compared to adults, because the child's brain has
 - ✳ Different dielectric constants , greater conductivity, smaller size, thinner cranial bones and distance from the radiation source..



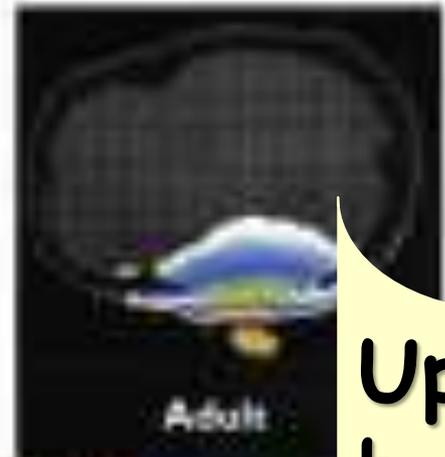
Children absorb more radiation than adults



5 year old



10 year old



Adult



5 years

4.5 W/Kg



10 years

3.2 W/Kg



Adult

2.9 W/Kg

Up to 2x in brain tissues
up to 10x marrow bone
Ref WHO/IARC
2011, 102

review Morgan et al Journal of Microscopy and Ultrastructure (2014) 197-204)

Ghandi et al. IEEE Trans, Microwave Theory & Techniques, Vol. 44(10), pp. 1884-1897, 1996



WINDOWS OF VULNERABILITY

INTERVENATION on PROGRAMMING
AND DEVELOPMENT IN PARTICULAR OF
FOETUS AND CHILD BRAIN

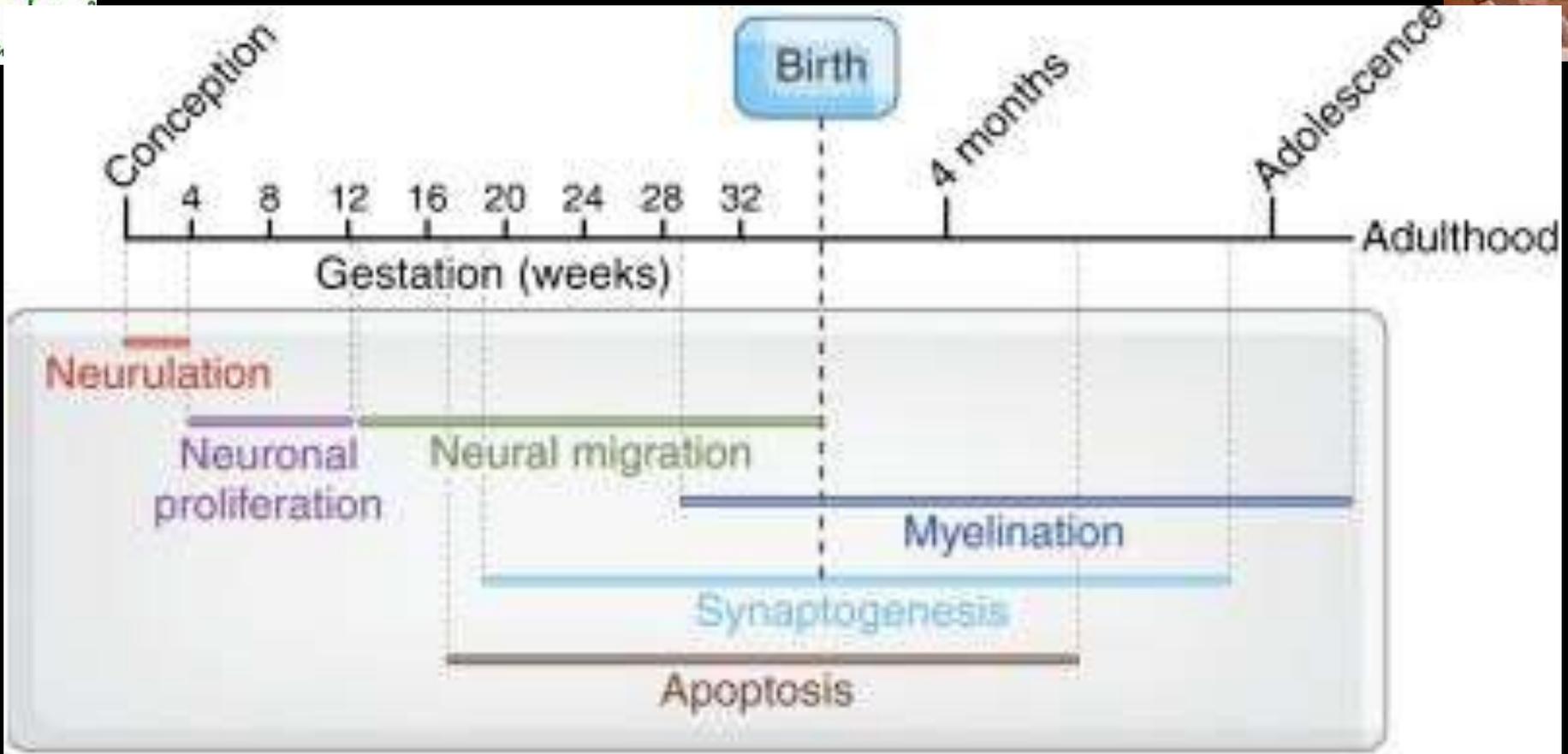
faster cell division
More susceptible
to genotoxic effects

WEAKENING of DEFENSE



Brain Development Processes

- The interaction of genetic inheritance and environment determines how the brain will develop



Brain neurological development

Figure 19 : Décours temporel des évènements majeurs du développement cérébral. Image de Giedd (1999) dans la revue de Tau and Peterson 2010 22 ANSES pg

Adapted from ANSES Pre consultation Opinion "EMF & Children", 2015



Essential Brain Development Processes

1. NEUROGENESIS is completed before a baby is born. (RFR may intervene in neurons development-distract nervous cells)
2. NEURAL MIGRATION Begins prenatally, but continues for at least 8 to 10 months after a baby is born. (RFR may intervene in the programming and of networking development)
3. MYELINATION begins in brain stem and cerebellum before birth, but is not completed in the frontal cortex until late in adolescence. (RFR causes myelin destruction)



Brain Development Processes

- 4. SYNAPTOGENESIS** It begins forming prenatally and continues throughout life. RFR may cause abnormal synaptogenesis
- 5. PRUNING** Some pruning begins very early in development. The most rapid pruning is between about age 3 & 16. RFR may interfere to normal pruning



Processes are affected by Environmental factors

- An exposure during development can initiate a cascade of alterations which may not be detected structurally or functionally until much later in life.
- The effects may be manifested as:
 - ✓ persistent deficits,
 - ✓ developmental delays,
 - ✓ or transient deficits.

Latency

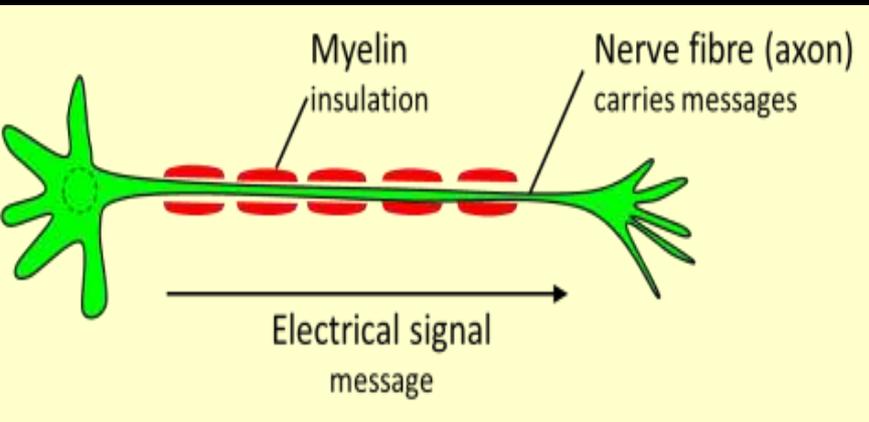
Ref Deborah Rice¹ and Stan Barone Jr.²Abstract



Development of CNS sheathing -MYELINATION



(M.Redmayne 2014, Rathus, 2010),(Paus et al,1999),(Yakovlev& Lecours, 1967



In CNS & PNS
Till middle age

Childhood to adolescence

25th week of gestation- 2years

4-5th month of gestation



Could Myelin Damage From RFR Exposure Help Explain the Functional Impairment Electrohypersensitivity? A Review of the Evidence

Mary Redmayne^{ab*} & Olle Johansson^c

Journal of Toxicology and Environmental Health, Part B: Critical Reviews .[Volume 17](#), [Issue 5](#), pages 247-258,2014

- in vivo and in vitro and epidemiological studies suggests an association between RF-EMF exposure and either myelin deterioration or a direct impact on neuronal conduction
- If myelin is damaged, the impulses traveling along the nerves slow down.



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- If myelin is not repaired, this results in a variety of symptoms and diseases. The most common of these is the autoimmune condition
- The greatest impact for humans would most likely be at each end of the life span.



INDIGATIVE EPIDEMIOLOGICAL STUDIES IN CHILDREN



- ✓ Headaches, dizziness, fatigue, sleeping problems concentration problems [Schreier et al., 2006; Rubin et al., 2008; Van den Bulck et al., 2007]

- ✓ Prenatal and Postnatal Cell Phone Exposures and Headaches in Children, *Madhuri Sudan et al, 2012*



- ✓ Prenatal and Postnatal Cell Phone Exposures and Headaches in Children, (*The Open Pediatric Medicine Journal, 2012, 6, 46-52, Madhuri Sudan*, et all*)





INDIGATIVE EPIDEMIOLOGICAL STUDIES



- **Increased risk for brain tumor development (meningioma, glioma, acoustic neuroma, salivary gland tumor) after 10 years of heavy use** [Hardell et al., 2002, 2006, 2009, 2013, 2014, 2015; Söderqvist et al., 2011, 2012—Orebro group-; Khurana et al. 2008; Baan et al., 2011]



- **Possible correlation of ASD (autism spectrum disorders) symptoms deterioration and EMF** [Thornton et al., 2006; Herbert and Sage C, 2013]



- **Behavioral problems in children, aggressiveness** [Divan et al., 2008, 2010]





PRESS
RELEASE

Cell phone use and behavioural problems in young children

Hozefa A Divan,¹ Leeka Kheifets,² Carsten Obel,³ Jørn Olsen^{2,3}

- **USAGE of mobile 2-3 times/day by a pregnant woman linked with behavioural problems in their child (DANISH cohort -13000 children)**
- **54% more risk for the child to develop behavioural social and sentimental problems by the age of 7**
- **The risk can go up to 80% when children are in addition continuing to be exposed postnatally up to their sevens to mobile**



INDIGATIVE EPIDEMIOLOGICAL STUDIES



-] **NEGATIVE OR NO EFFECT**

- **NEGATIVE**



- Prenatal cell phone use and developmental milestone delays among infants, *Divan. J et al, 2012,*



- *Limitation : The study addressed only the stages 6 & 18 months*



Vrijheid M, Martinez D, Fornis J, et al. Prenatal exposure to cell phone use and neurodevelopment at 14 months. *Epidemiology* 2010;21:1–4.



Neurodevelopmental behavioral- intellectual disorders



④ Attention Deficit Hyperactivity Disorder
(ADHD)

④ Autism

EMF-RFR?

Growing evidence of
potential correlation
with the onset or
symptoms of Autism



SUMMURY of EVIDENCE

- Time-varying electromagnetic waves have the potential to temporally modulate the nervous system,
- This modulation and temporal disruption might act to delay or disrupt vital calibration processes in infant (Thorton 2006)
- Based on strong evidence for vulnerable biology in autism, RFR can plausibly increase autism risk and symptoms.



SUMMURY of EVIDENCE

- Wireless devices such as phones and laptops used by pregnant women may alter brain development of the fetus. This has been linked in both animal and human studies to hyperactivity, learning and behaviour problems (*Bionitative 2012*).



EMF-RF is a synergic factor in the aetiology of Autism, acting in conjunction with environmental and genetic factors,

A significant role of EMF-RF in the **aetiology of Autism and the efficacy** of therapeutic interventions.

- ✓ **facilitating early clinical onset of symptoms or**
- ✓ **trapping heavy metals in cells: may accelerate the onset of symptoms of metal toxicity and impeding therapeutic clearance.**

T. J Mariea¹ ,G. L Carlo² (*J. Aust. Coll. Nutr. & Env. Med.* Vol. 26 No.2 (August 2007))



A POSSIBLE ASSOCIATION BETWEEN FETAL/NEONATAL EXPOSURE TO EMF-RF AND THE INCREASE INCIDENCE OF AUTISM SPECTRUM DISORDRES (ASD)

Robert C. Kane, Medical Hypotheses", Volume 62, Issue 2 , February 2004,

- It is suggested that fetal or neo-natal exposures to EMF-RF may be associated with an increased incidence of autism.

PART B



Precaution is the only
option



Myths and misconception

Vs

emerging evidence and realities



Mythos and Reality

Mythos

When devices are working within limits ICNIRP or Greel limits they are safe

WRONG

The Reality

These limits are referring only to thermal effects
They don't protect against

- non-thermal biological effects including cancer
- long term exposure



RFR-EMF & DNA Mythos and Reality



Mythos

■ Only the ionizing Radiation can affect the DNA



Reality

RFR/EMF can destroy the DNA via an oxidative mechanism and the formation of free radicals

It can also affect DNA Repairing Mechanisms:

Review 2015 "Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation in living cells», Yakymenko I. et al, Electromagn Biol Med, Early Online: 1-16, <http://informahealthcare.com/ebm>



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informa
healthcare

REVIEW ARTICLE

Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation

Igor Yakymenko¹, Olexandr Tsybulin², Evgeniy Sidorik¹, Diane Henshel³, Olga Kyrylenko⁴ and Sergiy Kyrylenko⁵



Review 2015 “Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation in living cells»,

Yakymenko I. et al, Electromagn Biol Med, Early Online: 1–16,
<http://informahealthcare.com/ebm>

Molecular effects induced by low-intensity RFR in living cells includes

- significant activation of key pathways generating reactive oxygen species (ROS),
- activation of peroxidation,
- oxidative damage of DNA and changes in the activity of antioxidant enzymes.



Review 2015 “Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation in living cells»,

Yakymenko I. et al, Electromagn Biol Med, Early Online: 1–16,
<http://informahealthcare.com/ebm>

- From 93 studies of 100 peer-reviewed studies demonstrate
- low intensity RFR induced oxidative effects is one of the primary mechanisms of the biological activity.
 - A wide pathogenic potential of the induced ROS and their involvement in cell signaling pathways explains a range of biological/health effects of low intensity RFR, both cancer and non-cancer pathologies.
 - low-intensity RFR **is an expressive oxidative agent for living cells with a high pathogenic potential**



EFFECTS ON DNA

Repairing process of DNA can be compromised

- The embryonic stem cells cannot adapt to chronic exposure to **RF/EMF** and cannot correct damages
- DNA Damages of other cells cannot always corrected effectively



Weakening of repairing, healing mechanisms and apoptosis



ΜΥΘΟΣ ΚΑΙ ΑΝΑΔΥΟΜΕΝΗ ΠΡΑΓΜΑΤΙΚΟΤΗΤΑ



ΜΥΘΟΣ

■ Η ενέργεια των Wi-Fi είναι χαμηλή και ασφαλή



ΠΡΑΓΜΑΤΙΚΟΤΗΤΑ

- Ναι είναι χαμηλότερης ενέργειας από το κινητό. Όμως η έκθεση είναι πολύ μεγαλύτερης διάρκειας που σε συνδιασμό με την παλμική φύση τους τα καθιστά ιδιαίτερα βιοδραστικά
- Όταν ο υπολογιστής είναι ενωμένος μέσω Wi-Fi η ακτινοβολία είναι παρόμοια η/ και μεγαλύτερη εκείνης της Αντένας κινητής τηλεφωνίας σε απόσταση 150 μετρα
- Αρα τουλάχιστον εξίσου επικίνδυνη μ' αυτήκαι είναι μέσα στο σπίτιόλη μέρα Κάθε μέρα



Mythos and Emerging Reality about Wi-Fi



REALITY

Mythos

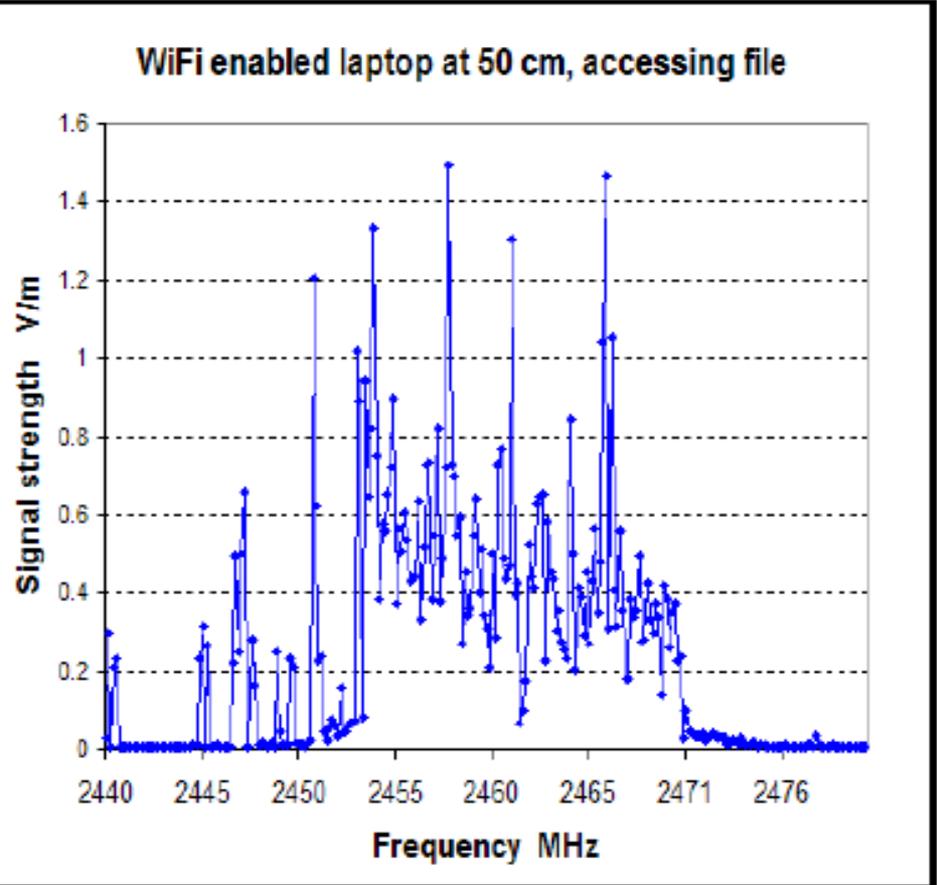
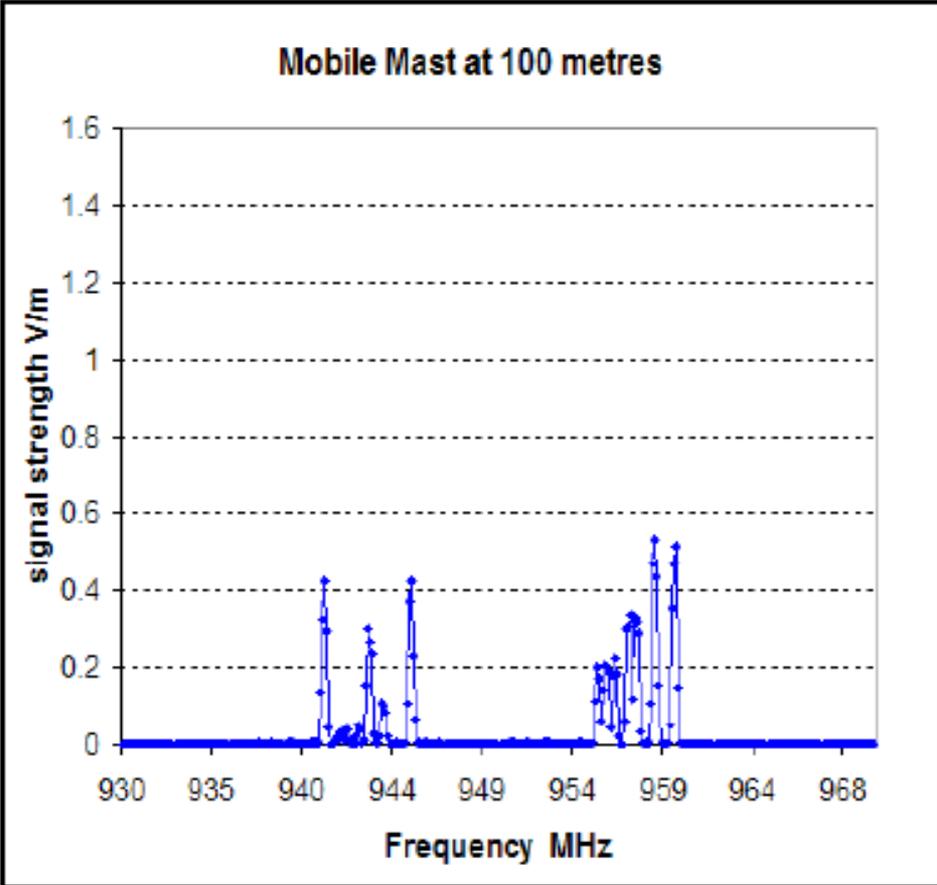
Because the energy emitted is relatively low they areSAFE

WRONG

It is true that the average Wi-Fi emitted energy is much lower than the one from mobile. However

1. WI-FI HAVE PULSES & PEAKS OF VERY HIGH INTENSITY
2. EXPOSURE DURATION CAN be VERY LONG FOR SOME HOURS To 24h
3. The user of a A laptop connected to WiFi (depending on the managed data) can receive radiation similar or even higher than the one he could receive if he was at a distance of 50m-150m from a Mast.

Radiation from Cell Tower 328 feet vs. Wi-Fi enabled Laptop at < 2 feet



PASSIVE

- Wi-Fi routers cause passive exposure to not-users
- 
- Distance of at least 4m up to 10m should be kept from places where children are playing, staying or sleeping.
 - WiFi should always kept closed when not in use especially when pregnant and children are near by.

ACTIVE+PASSIVE

The user is exposed to the highest exposure through wireless connections via Wi-Fi, 3G or 4G . This applies also to any bystander

Because of proximity and the high intensity of pulsed signals transmitting data



Wi-Fi: Active and Passive Exposure



4-10 μέτρα



Use of laptop computers connected to internet through Wi-Fi decreases human sperm motility and increases sperm DNA fragmentation

Conrado Avendaño, M.S.,^a Ariela Mata, M.S.,^a César A. Sanchez Sarmiento, M.D., Ph.D.,^a and Gustavo F. Doncel, M.D., Ph.D.^b



- *Conrado Avendaño, M.S. et al.*, *Fertility and Sterility* Volume 97, Issue 1, Pages 39-45.e2 (January 2012)
- Use of laptop computers connected to internet through Wi-Fi decreases human sperm motility and increases sperm DNA fragmentation after 4 hours of usage.
-)



Do we wish an ANTENA IN OUR HOME??



WE OPPOSE
TELEPHONE
MASTS CLOSE
TO OUR HOMES !!

HOW CAN WE
VOLUNTARY PUT
ANTENNAS
INSIDE ??



Wi-fi: like a phone mast in your home

CONTINUOUS

CUMULATIVE
EXPOSURE

Wi-Fi in schools?? It is convenient but... Can be Dangerous ?





Wi-Fi in school can be like this !!!

A multiple disperse exposure
7h/5d/week /every working week

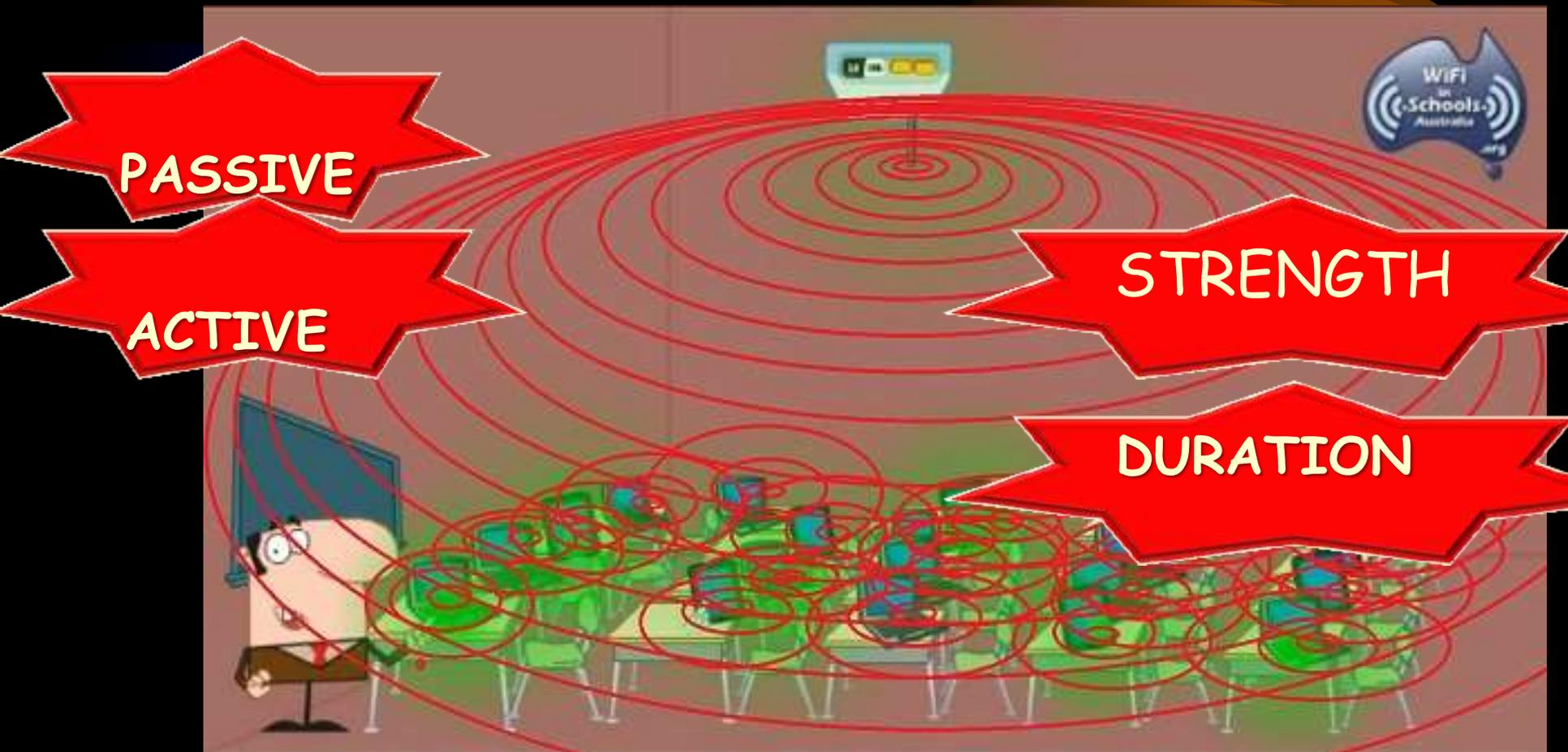


Image adapted from the excellent
video by [WiFi in Schools Australia](#)
SCMichaelidou



AGAINST OR RESTRICTING SCHOOL Wi-Fi



assembly.coe.int

Council of Europe

2011

,Resolution 1815 8.3.2. for children in general, and particularly in schools and classrooms, give preference to wired Internet connections, and strictly regulate the use of mobile phones by schoolchildren on school

- **Medical and Scientific Associations,**
- **many countries France Germany Austria Italy ,Israel**
- **French national libraries (BNF)** has impose a moratorium on wi-fi networks in French libraries..



No Wi-Fi in Kindergarden



France February 2015 : Legislation prohibiting
Wi-Fi in kinder garden

What about to "Self-Prohibition" in our homes

????
SCMichaelidou



The Austrian Medical Chamber (40,000 doctors):



- **Wi-Fi environments will lead to high microwave exposure for students and teachers which might increase the burden of oxidative stress.**
-
- **Oxidative stress might slow down the energy production especially in brain cells and may lead e.g. to concentration difficulties and memory problems in certain individuals.**
- **The Austrian Medical Association recommends "Wi-Fi free school environments."**

<http://wifiinschools.org.uk/resources/safeschools2012.pdf>



MYTHOS AND REALITY

MYTHOS

- Wireless Baby monitors are safe

Wrong

The CHOICE

- Wired or analogue type but always at a distance of 2m

REALITY

- At a distance of 1m radiation is of the same order of magnitude as the radiation from a must at 150m

3 BASIC KEYS TO REDUCE EXPOSURE

- Keep Distance from the source, use hands free
- Reduction of the exposure duration and frequency
- The usage must be inverted proportional to the age of the child
- OPTION for wired not wireless
- Deactivate all Wi-Fi, Bluetooth, 3G, 4G when no in use, when pregnant or child is near by, and always in the night.
- **Children with existing neurological problems that include cognitive, learning, attention, memory, or behavioural problems as well with chronic diseases e.g cancer** must be provided with wired (not wireless) learning, living and sleeping environments,



Pregnant woman

Wireless devices such as phones and laptops used by pregnant woman may alter brain development of the fetus.

- Avoid mobile or wireless telephone Use hands free for very short call and with deactivated WiFi, Bluetooth 3G,4G
- Avoid Wi-Fi go for Wired. Avoid all wireless connected iPad, lap tops etc
- Never sit between computer and router or close to a router keep a distance of 4 to 10 m.
- Keep a distance from people using their smart phones or iPads or in general connected wireless through Wi-Fi, 3G or 4 G



Infant and children below the age of 14-16



- ☀️ Mobiles and similar devices should be avoided., especially smart phones .
- ☀️ The use at schools elementary and Gymnasium it should not be permitted. It will cause a wide range PASSIVE exposure .
- ☀️ Tablets / iPads/mobiles can be used as devices for music or video provided that 'these have been preloaded by the parents and devices are on Flight mode with Wi-Fi, Bluetooth και 3G or 4 G deactivated
 - ☀️ Usage should be short depending on the age , maximum 30min /d for pre-schoolers
 - ☀️ Never be given to a child before the age of 2. (American Medical Association)





All these
are not toys!!!!



<http://dx.doi.org/10.1016/j.jmau.2014.06.005>



For Adolescent older than 14-16



- ➔ Delay the purchase of smart phone
- ➔ Raise awareness and educate on potential risks once their mobile or tablet or iPads or other smart devices are connected to the internet WIRELESS through Wi-Fi ή 3G & 4G etc.
- ➔ Educate them to the reasonable and essential usage : SMS , short calls always with hands free or loudspeaker and always deactivated Wi-Fi, Bluetooth, 3G, 4G when they are not using them
- ➔ Advice to keep mobile away from their body, never in the pockets, bras or bust . Never in their bedroom or next to their bed unless in flight mode. Never use it in the car or in elevators and in general in places with weak signal



Mobile Uploads

Back to Album · Wendy's photos · Wendy's Timeline

Previous Next

PLEASE SHARE THIS!!!
If you are storing your cellphone
in your bra, please stop
immediately!

Save the girls

Doctors warn that unusual
breast cancers are occurring
in women who stored
cell phones in their bras.

#SaveTheGirls www.ehtrust.org

www.iamreinventingme.com

Andy Holt
I'm not going to see my 53rd birthday because of this. I have rare and aggressive breast cancer that is now terminal after years of keeping my phone down my bra. Please please please listen and DONT DO IT — with Carole Holroyd.

Share · 18 May near Reading

4 people like this.

1,964 shares

Album: Mobile Uploads

Shared with: Public

Open Photo Viewer

Download

Embed Post





**Προστατέψτε
τα παιδιά και τις εγκύους από τους πιθανούς
κινδύνους της ακτινοβολίας που εκπέμπεται
από τα κινητά τηλέφωνα και άλλες
ασύρματες συσκευές και τα Wi-Fi**



**«Η μη ιονίζουσα ηλεκτρομαγνητική ακτινοβολία ραδιοσυχνότητας
(30kHz-300 GHz), η οποία συμπεριλαμβάνει την ακτινοβολία που
εκπέμπεται από τα κινητά τηλέφωνα, τα Wi-Fi και άλλες ασύρματες
συσκευές/συνδέσεις επικοινωνίας, κατατάσσεται στους πιθανώς
καρκινογόνους παράγοντες για τον άνθρωπο»
(Παγκόσμιος Οργανισμός Υγείας, 2011)**

Με τα παρόντα δεδομένα και ενώ η έρευνα εξελίσσεται, στη βάση της Αρχής της Προφύλαξης, η προφύλαξη του εμβρύου και του παιδιού και η μείωση της έκθεσής τους στην ηλεκτρομαγνητική ακτινοβολία, είναι η μόνη υπεύθυνη επιλογή.

Στον οδηγό αυτό θα βρείτε χρήσιμες πληροφορίες που θα σας βοηθήσουν,
με δικές σας ενέργειες, να προστατέψετε τα παιδιά σας.

Σεπτέμβριος 2015





Don't Irradiate your child !!



Source: adapted from weekly
healthylife 2015



Never work
close to a child



CLOSING REMARKS

1

Are we Absolutely sure of all effects?
No because we don't have yet all the answers and the full picture of potential long-term. Effects or on synergistic effects. Studies especially focusing on children exposure are scarce. BUT on the other hand

the security of the technology has never been pre-market tested under realistic exposure conditions nor has been proved



CLOSING REMARKS

Limits are obsolete, covering only short exposure and immediate thermal effects

The industry claims that they are within limits..... Which are irrelevant to the present exposure and do not take into account long term effects and emerging scientific evidence

CLOSING REMARKS

4

The existing scientific evidence and the degree of the potential risks indicate the necessity to immediately apply the PECAUTIONARY PRINCIPLE COM2000, AND ALARA PRINCIPLE -----as little as feasibly possible



COUNCIL OF EUROPE Resolution 1815 (2011)



- STANDARDS based on **the ALARA as low as reasonably possible**
- **Precautionary Principle** should be applied when scientific evaluation does not allow the risk **to be determined with sufficient certainty.**
- **APPLY reasonable measures to reduce exposure foetus, children, teenagers, young people of reproductive age**
- **Information and awareness-raising campaigns**
- **Protect electro sensitive people**
 - ✓ **creation of wave-free areas not covered by the wireless network**





Encourage precautions right now based on present knowledge

5

- **Physicians and health care people should raise the visibility of EMF-RF as a plausible environmental RISK factor in clinical evaluations and treatment protocols.**
- Advise parents for safer options
- Ministry of Health and doctors: Push for systematic monitoring of the impacts in learning and care environments. Demand that this should reflect realistic scenarios of exposure and effect and evaluation with criteria relevant to biological effects

THANKS FOR YOUR KIND ATTENTION

**CYPRUS NATIONAL COMMITTEE ON
ENVIRONMENT AND CHILDREN HEALTH**

www.cyprus-child-environment.org





KEEP ALWAYS DISTANCE FROM.....

- Microwave oven : 50 cm
- Electrical cooker : 30 cm
- From PLASMA TV at least 2m
- Wireless playing consoles 2 - 3 m



Wi-Fi in Schools

- Avoid installing and using wireless connection (Wi-Fi) at kindergartens, playgrounds and schools.
- If, however, the kindergarten/ playground/school is equipped with Wi-Fi, to diminish the exposure of children:



WiFi in Schools

- ✓ do not install or operate Wi-Fi routers in the rooms where children are sleeping or playing or to adjacent rooms. The distance from the router should be at least 4 meters and preferably 10 meters even if a wall is interfering.
- ✓ The Wi-Fi of the kindergarten or the school should be kept turned off, when children are at school.



CLOSING REMARKS

There are alternatives and options although may be ...less convenient .

BUT now we know and we should never allow our children to become "Experimental animals" ...to provide concrete evidence

3





THE EXPOSURE

- ▶ **Multiple sources in, schools, playgrounds, home (Wi-Fi, cell phones, I pads baby monitor etc)**
- ▶ **Repeated, intermittent exposures (every day 365/Y) up to 24h/d exponentially growing**



New 25 million study in USA of the NT





Could Myelin Damage From RFR Exposure Help Explain the Functional Impairment Electrohypersensitivity? A Review of the Evidence

Mary Redmayne^{ab*} & Olle Johansson^c

Journal of Toxicology and Environmental Health, Part B: Critical Reviews .[Volume 17](#), [Issue 5](#), pages 247-258,2014

The greatest impact for humans would most likely be at each end of the life span.

- The CNS of the foetus, infant, child, and adolescent is more susceptible because myelination is incomplete and neural connections are rapidly forming and pruned
- older people because their myelin protection is already degenerating..



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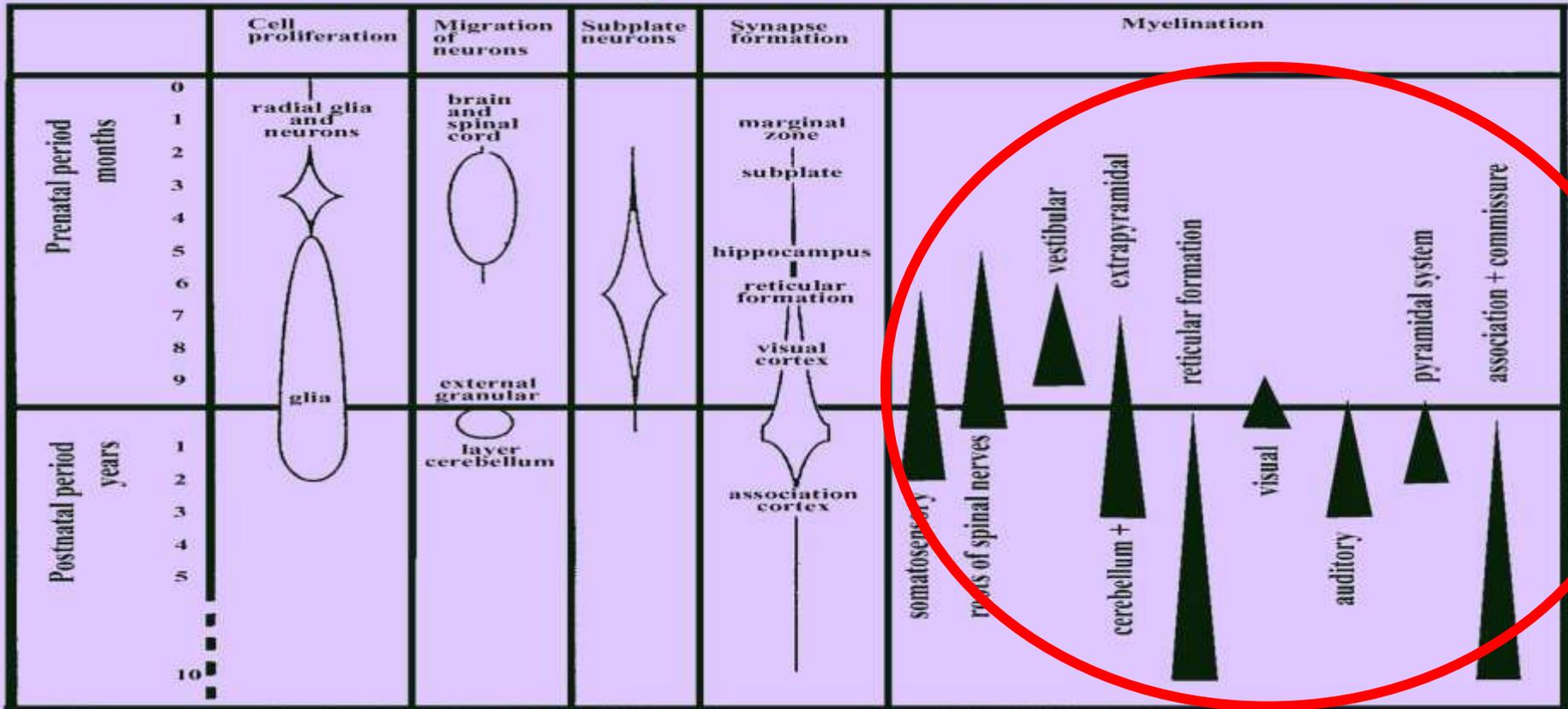
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Time Lines of Developmental Processes in Humans



Rice and Barone, EHP 108(S3):511-533, 2000. Adapted from Herschkowitz et al., 1997

1. Proliferation of radial glia and neurons. These continue to develop and is not complete until almost 3 years of age
2. Migration of neurons, which occurs from the 2nd to the 6th month of gestation, and again within the cerebellum postnatally
3. Synapse formation, which occurs essentially in the last trimester and in the first 2 years
4. Myelination begins in the second half of gestation and goes on to adolescence, targeting to different systems.

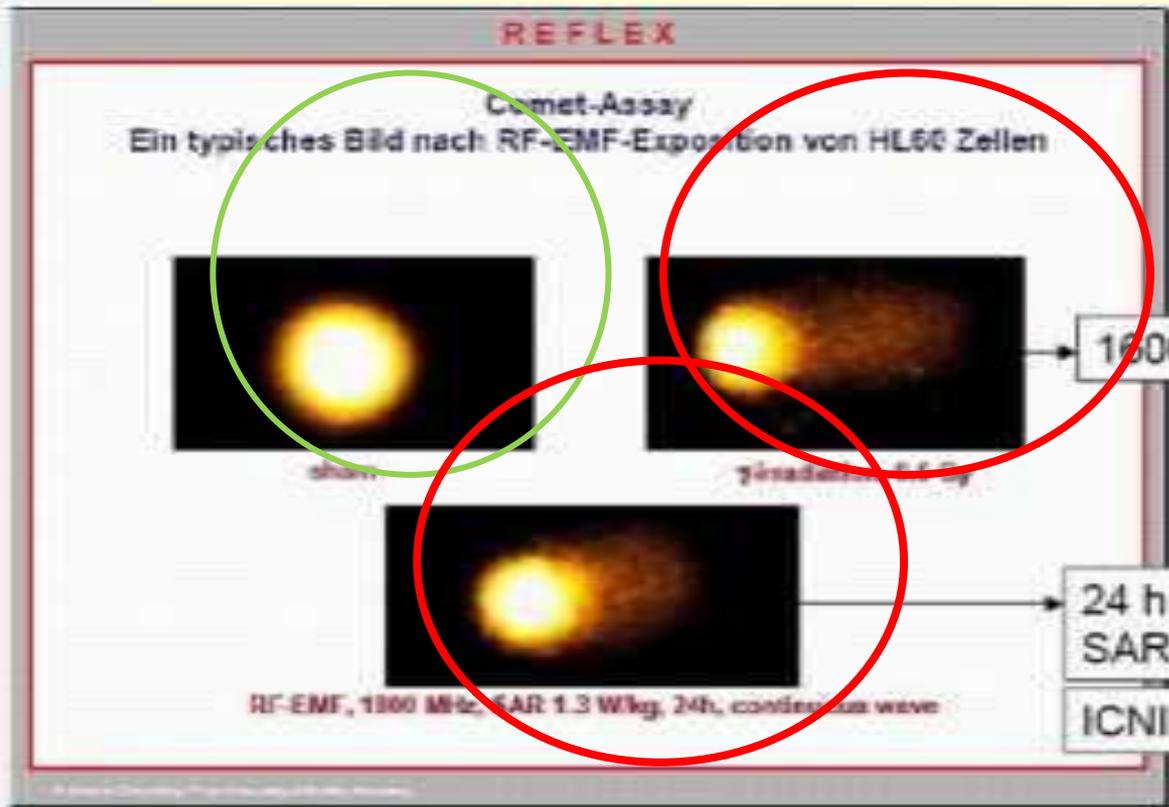


The effect of mobile phone use on DNA...

DNA damage from 24 hours of mobile phone use is similar to a large dose of gamma rays from a radioactive isotope. If the DNA is broken, the resulting small fragments can form a tail like the tail

1 Human: promyelocytic cell line HL-60 fibroblasts, lymphocytes and thymocytes, neuroblastoma cell line NB69 and neural stem cells, Brain cells of different origin and monocytes, endothelial cell lines EA.hy926 and EA.hy926v1, (12)

Animals : Mouse embryonic stem cells and rats granulosa REFLEX 2004 EU funded



12
Human
cells

2
animals
cells

1000 chest x-rays

24 h mobile phone
SAR=1.3 W/kg

ICNIRP/WHO = 2 W/kg



MULTIPLE and PROLONGED EXPOSURE can cause



- ADDITIVE EFFECTS
- MOSTLY IRREVERSIBLE CUMULATIVE DAMAGES
- The evidence is growing and at the moment is the tip of an emerging iceberg



Protect others from passive exposure

- **When pregnant and children are close to you:**
 - ✓ Keep a distance at least of 1m when you are calling
 - ✓ Keep deactivated WiFi, Bluetooth 3G,4G ..
- **Mothers when are nursing the child:**
 - ✓ Should never use mobile lap-tops, iPads, tablets.
Should avoid to sit close to Wi-Fi router (at least 4-10 m away) unless it is deactivated
- **Avoid using wireless digital baby monitors. Choose wired or analogue type . In any case monitors should put 2m away from the baby. Never in or on the bed**



Connections to the Internet

- **Opt always for Wired Connection**
- **Avoid Wi-Fi . When this is impossible the following should be strictly applied**
 - **Keep routers closed when children or pregnant woman are in home, when you are not using them and always KEEP THEM CLOSED DURING THE NIGHT**
 - **Put routers at a distance at least 4m - 10m from sleeping, playing sitting areas**



Connections to the Internet

- **Look for Kinder garden and Play places without Wi-Fi**
- **Wi-Fi should be avoided in schools especially in elementary and Gymnasium at least**